

I'm going to try a different format from last time. I will really try this time, for my benefit as much as yours, to allow a couple of periods of questions. And also feel free to raise your hand and I'll try to recognize you as I'm talking. That's fine if you have a question on clarification in particular. And let me reserve the right to put off an answer until the question period if I want to keep going, but I'll try to recognize you at the time. So I'll try to talk for about an hour and have 20 minutes for discussion and then we'll have a 15 minute break or so and talk for about another hour and another 20 minutes of discussion and maybe a last summing up.

The premise really of the sequence of topics in this course (and I'm running a bit behind but I think that's going to be OK) is that there is a good deal to be learned about our present situation in the world and our prospects and perhaps even the prospects for changing it if we learn what is now available to be learned in the public record about several earlier periods in our history—processes in history. In particular the strategic bombing campaign which followed from the application of strategic bombing doctrine in the Second World War, a doctrine that had begun soon after the First World War. Several of the times in my life have really formed my own opinion as to the relevance of all this.

I came in to the defense establishment in the late fifties in time to be part at what came to be a fairly high level of one of the great buildups of destructive power in the world and the United States—the Kennedy buildup following his campaign to erase the missile gap in 1960.

That gave me some indication of just what could happen in the world as a result of wrong estimates and an interest in finding out how estimates of that kind—of the missile gap—had come about in the United States government and how it came to be that they were responded to as they were by the immense buildup of our missile and Polaris force even after the error had been discovered. As we'll see later, the final Kennedy decision on the number of strategic missiles to buy—of Minutemen missiles to buy—was made in November of 1961. This is spelled out in great detail in a book by Desmond Ball on (I've forgotten the name exactly) The Political Economy of Strategic Decisions, I think, something like that. He makes it clear that this decision was made in November after the new estimate had come out revealing that the predictions of an immense gap in favor of the Soviets had been false and in fact after it was known that what the Soviets had was 4 ICBMs. And it was after that decision came through that Kennedy added to the 4, 40 ICBMs that we then had and the 48 Polaris missiles that we then had and the over 100 IRBMs, the 200 warheads that we then had facing the 4 Soviet warheads opposing the United States. It was after that that Kennedy decided that the appropriate number of strategic missiles to buy was 12 hundred which he later reduced to 1,000.

That needed some explaining in my mind. As I say I was part of that process. But eventually I moved to a different subject in the U.S. government which was the growing Viet Nam crisis as of 1964 and in the Defense Department I participated this time very critically but still participated in the earliest stages of our escalation of the bombing of

Viet Nam beginning with the Tonkin Gulf reprisals—our first attacks on North Viet Nam in August of 1964—proceeding on to (as Special Assistant to the Assistant Secretary of Defense) the beginning of the so-called Rolling Thunder Campaign which was a campaign of bombing—steady bombing—of targets in North Viet Nam which was early conceived by McNamara as a bargaining chip in effect, a bargaining instrument. As he put it, something we could stop.

We needed an inducement to get the North Vietnamese to accept our terms. We didn't have a lot to bargain with yet in that area and bombing them was something we could "offer to stop." If it didn't work we could always stop that. In fact the bombing was entered into more easily as an alternative to troops which were perceived by that time as something that might commit us in a way that would be very hard to stop. And early on in the spring of 1965 the bombing was considered as something that could be turned on and off. In particular if it proved ineffective. It did prove ineffective and it was stopped. Ten years later. After the major part eight years later in the course of which seven and a half million tons of bombs were dropped on Viet Nam and Indo China which was almost four times the total tonnage of WW II in all theaters. This too was a replay of the bombing experience of WW II in many circumstances. And in fact, a number of people from the outside raised the question, how could people who had had some experience of the bombing results in WW II have entered on such a coercive process hoping to win a war by high explosive bombing.

In any case, one of the phenomena that I observed during that time, very much as a participant, was that by 1968 (by which time I had been to



Viet Nam and come back and had spent two years there and had a pretty intimate knowledge of this stalemate that existed. By 1968 that perception of the war was joined by virtually everyone known to me in the Pentagon with the possible exception it was put by some people of Lyndon Johnson, Walt Rostow, his special assistant, and Dean Rusk, the Secretary of State. No one could think of anyone else really who believed in what we were doing, believed that it would work, believed that it would gain the results of any useful sort, believed that it should continue. But we had five years to go of heavy bombing, seven years before the end of the war.

In fact in the next five years from the Tet Offensive of '68 by which time we had dropped one and a half million tons of bombs or as much as we dropped in all of Europe in WW II, we proceeded to drop another six million tons of bombs—three WW IIs after the Pentagon had arrived at a virtually unanimous opinion that this process was hopeless and useless, a waste of planes, captives, money, and people. I was not alone in believing at that time that to continue a process of killing that had no possibility of achieving any U.S. purpose was wrong, was even immoral, was unjustifiable homicide, that is to say, murder.

That wasn't a universal perception. It was not a conversion of me to a pacifist point of view. That's why I stated it so carefully. But there were a lot of people, particularly outside the Pentagon, who did have a moral judgment that although violence could be justified in many circumstances, had been justified in WW II for example, that violence needed to be justified; and when the prospects were that the violence



could not achieve anything at all it should be stopped, and stopped because it must not continue—because it was wrong.

A man who came to be a close friend of mine after I had read his writings and concluded I had a lot to learn from him, Noam Chomsky, from that day to this has been very cynical about that sort of thing as a moral judgment. I had no problem in—he thought it was hypocritical. These are people who don't believe in principle. They are against violence only when it can't work which he was very contemptuous of. I recognized that as a kind of morality, as a moral feeling and a moral judgment and of course it's because I'd shared it. That's the way it felt to me and I knew it felt that way to others, and it was meaningful to say that it was possible to turn away against the war when it wasn't working on a moral basis or on this kind of judgment even if you could accept the possibility of intervention in some cases.

That judgment was recognizable as within the just war doctrine that I discussed last time. Initially a Catholic doctrine, later accepted by those Protestant churches closest to the Catholics such as the Church of England, the Lutherans, Presbyterians, some others, though not by all churches (it's not the only moral doctrine that's been accepted) but the notion that there must be a justification for killing and that some kinds of killing cannot be justified at all. And as I said last time I think one of the things to be learned from the WW II experience and again from Viet Nam and from the process of building up destructive power, and the targeting of destructive power, the war plans and the arms race of the 50s the 60s and the 70s and today (that's another process), and finally

in the circumstances under which it is realistic to expect an American president to consider initiating nuclear war in a crisis. A factor in all of these situations, it partly explains (doesn't justify, but it explains) how they developed as they did, is to become aware that wherever the bureaucrats and the officials and the presidents started from, morally speaking in their upbringing and their schools, by the time they were working on these processes in the course of wars they had in fact rejected that particular constraint, that particular moral constraint on what they were doing. It's not the only thing of note about this but I'm emphasizing it for a number of reasons. The fact that such a constraint existed in the minds of many, in fact had its influence on the way these plans developed, even in the hands of people who themselves no longer felt a loyalty to that particular principle.

For one thing it led to great secrecy in lying about what it was they were doing. Another point that I'll come back to is that I think as a result of that secrecy, in part, there has developed a considerable gap between certain elites who have been in and out of government and have been close to these plans, or who are managing these matters right now, and the attitude to the public in terms of what the public regards as permissible, as legitimate, as reasonable in the way of risk or operation. I'll come back to that as I say but I'll just mention it now because I think it is in that divergence that there really is a hope for changing this situation as I think it needs changing. But we're starting with the notion and we're trying to understand these things and I have to keep going back a bit to certain earlier attitudes as benchmarks for

social attitudes on this matter because some of these attitudes have changed so much in the course of the twenty years and that is a fact of our state, of our existing, but it's really hard to be aware that anybody ever had different attitudes. Let me leap ahead to say that I think that if we are to change the process that is leading, I think, with rather high likelihood to human extinction, or to the destruction at least of most cities, certainly of the northern hemisphere and probably of the world, a situation that if you see it that way I think you'll agree with me deserves effort to change. I think part of that change, well a major part of the course, will come from a better understanding of how these processes, these four processes that I've described did operate, and the other part will come, I think, from recalling to ourselves and discovering a new loyalty to certain kinds of constraints as to what our political representatives may do for our interests and in our name that really used to be very commonplace understandings and that have become very eroded. And I think there is a real possibility that that recalling, that recollection, will occur. It is occurring right now. I can almost sum up the last lecture by reading a paragraph here from the diary of David Lilienthal who if he's known to you at all is probably know as the first director or the main director of TVA, the Tennessee Valley Authority, who was also an early atomic energy commissioner, he was Chairman of the Atomic Energy Commission. In December '47 he wrote this

Is not the worst fact about modern scientific weapons notably the atomic bomb, the effect they have on moral concepts, those patiently built fragile steps out of the



jungle from which man has emerged. For centuries men have fought wars, but these were fought within certain rather well defined ethical line fences. I don't mean only those international rules of warfare embodied into some law, international law, although that is involved, I mean the fact that warfare was something like a game [only for the last few centuries] and the presence of ethical limitations and standards was always recognized. An unarmed man was not to be shot, a man who put on the uniform of the enemy had stepped over the line and could be simply dealt with, etc. Then the Italians bombed villages of the Ethiopians and expressed pleasure over the sight. Everyone recoiled with horror. The Germans obliterated an area of Rotterdam. This is a crime for it wiped out the notion of an individual adversary, in particular an armed adversary. The V-2s were directed against anyone who happened to be there, not against a military target, that is an individual adversary. Then we burned Tokyo. Not just military targets, but set out to wipe out the place indiscriminately. The atomic bomb is that last word in this direction. All ethical limitations of warfare are gone, not because the means of destruction are more cruel or painful or otherwise hideous in their effect on combatants, but because there are no individual combatants. The fences are gone, and it was we, the civilized, who have pushed standardless conduct to its ultimate.

Most of the talk about the bomb relates to the danger to the world in a physical sense. But isn't the real danger to civilization to be found in the recognition that warfare is no longer conflict within limits imposed by morality but without limit, without moral containment? Klasevitz had defined strategy pretty closely as the use of combats to achieve strategic purpose, a military or political purpose. (Combats being defined as the engagement of armed military organized units with each other.) The use of combats then, where tactics is the technique of combat, the engagement on the ground, and strategy then was the use by a general or a high command of resources and deployments in such a way as to use combats globally or in a continent in a way that would serve a

purpose. Combat then was contrasted with massacre or the use of organized violence against unarmed people, nonorganized military people, against civilians, against women and children. Strategic bombing doctrine, reacting in part to the slaughter of military under the machine guns in WW I, changed the notion of strategy. It became the use of combats and massacres to achieve a military purpose; and what we're talking about is a 20th century process (evolution) in which massacre has come to be, in the eyes of government officials of many governments, a legitimate instrument of policy.

There are examples, perhaps one of the greatest after WW I, examples of the slaughter of civilians in the course of carrying out a policy was the collectivization process in the end of the 20s and early 30s in the Soviet Union, followed by massive political purges, the deaths of millions of people, very much in the mind of Hitler, actually, when he organized his massacres of German civilians and Jews, and Jews and other ethnic groups in East Europe and Russia. Two well known examples of massacres. Moreover Hitler was the first to put into practice in a large scale, the use of bombers against civilians in the London Blitz in 1940. The adoption of that same practice by the British and then by the U.S. (I'm repeating a little from the last lecture, but not for too long) was not an unprepared ad hoc response to this use by Hitler. In fact, the bombers employed for this, four-engine bombers had been ordered and designed in 1936 and 1939, well before the war, but in order to carry out a doctrine that dominated British RAF as I mentioned last time, from the early 20s on, well, just after WW I and likewise the American Air Force.

Last time I mentioned several ways in which a doctrine which was not entirely defined as aimed at civilians by all its participants came to be that. The American Air Force in particular which, along with the British, was the only one to pick up this notion of the strategic bomber, the long range, heavy, high flying bomber as a major instrument of warfare, Hitler built no four engine bombers and thus went in to the Blitz without bombers that were really adapted to that purpose, part of his limitation. The Americans on the whole did not conceive of the use of these things as had the theorist Douhet of Italy or the major RAF theorists in their emphasis on the morale of civilians as the target the Americans had emphasized the precision available and the attack on industry. But as I described last time, for a number of reasons, this moved rather quickly to adoption of a different kind of operation, an operation (by the British) directly against cities and ultimately the Americans adopted this too, by late '44 and early '45.

One factor, and I want from now on to begin emphasizing, bringing out things that I didn't last time, that applied to these various processes, to Viet Nam, to future uses of air power and nuclear weapons, and to the planning in general. One factor was that the precision of both bombers and missiles, the operational precision, has systematically and almost always been overestimated. Not in terms of overestimating what could be achieved ultimately with a given development and guidance in practice, in testing, but always a tremendous over optimism as to the precision that was available at this point or next year with the weapons at hand when they were used in actual operations for example by nonelite troops going



against an enemy under wartime conditions and facing defenses in particular.

A key thing which turned up in the Second World War which does not particularly apply now was that defenses, fighter defenses and anti aircraft defenses guided by radar proved to be an immense obstacle for bombers to get through and greatly limited their ability to be precise, flying against flak, flying against fighters, you could not begin to drop the nice tight bomb pattern, hit the targets you could do back in Texas or Louisiana. Other aspects I've mentioned were navigational problems which eventually did get solved and are pretty well solved now, target location problems, but in any case one fact that came out then which has been true for various reasons ever since is that air power has turned out to be, and missile power, and nuclear power, have proved to be a very blunt instrument, a hammer, a massive hammer, despite at the same time recurrent fantasies that it was a surgical tool that could be used with very great precision.

That latter notion was very important in building an allegiance to the idea of air power as a way to victory. And really what one can see since the airplane was invented really in the minds of some, and in the minds of national leaders for the last 30 years or so, or 40 years, is a struggle to answer this question. How do you harness the destructive power of long range bombardment from the air to the goals of political influence? How do you transmute destructive power into political power? And that was a question that seemed at various times with new technical developments to have very simple answers. In part, as I say, reflecting

this misbelief that destructive power could be used quite precisely and just exactly where you wanted it in effective quantities. It did not have to be very large.

This, by the way, led to the ease with which (the fact that there was some imprecision was understood) the ease with which some "collateral damage," some civilian damage which everyone understood was part of the cost of doing this process. The ease with which that civilian damage was accepted reflected in part this belief that it could be very small, that by aiming at the right targets you could avoid hitting very many civilians, compared especially to the costs of ground warfare as in WW I. So a few planes, a few civilian deaths could do it.

There was another misconception that has applied in all of these processes very much and that is that a very deep contempt for the target, the people being targeted. Initially this was a contempt of military for civilians, who were the targets. A feeling, by the way, that the civilians had got off very easily in WW I, had sent their sons or citizens off to war rather blithely, let them die by millions while the people at home were very safe. It also reflected a considerable degree of panic in London and elsewhere with the very first bombing raids that took place in 1917 and '18 but in any case the effect was civilians were believed not to be disciplined, they were not troops, they were not elite, they were not as patriotic, as dedicated as military men, especially enemy civilians and therefore a few bombs would quickly panic them.

One of the obstacles, then, to this problem of harnessing destructive power in the end to political power turned out to be that the civilians

were amazingly resilient under bombing, in fact they acted like the military, their morale held up as well as soldiers. They did their job, they may have been very unhappy, they may have grumbled, they may have had bad morale but it didn't keep them from working, it didn't keep them from obeying their authorities, if anything it gave them a clear instinct of the monstrous nature of the enemy they were fighting, the likelihood that surrender would lead to a terrible situation so if anything it made them more dedicated to the war effort. And this happened in Viet Nam as well by the way. There was a statement I've heard quoted in Germany (I don't speak German, I can't repeat it) in German but it was "Enjoy the war, the peace will be terrible." And in part this reflected the experience they were having at the hands of their opponent, that is us, our willingness to destroy their cities did not reassure them in fact as to what the peace would be like. That kept them in the war somewhat longer than they might have otherwise.

This turned out as I say to be true in Viet Nam to everyone's surprise in the Pentagon. Racism enters here although as I say in the German case it wasn't critical. But there is a dehumanization of the opponent whoever it is, an industrial opponent or an underdeveloped country, country of a different race, in each case which seems to operate very widely in the world, not just over here. An unwillingness to believe that an opponent is able to stand up to the kind of punishment that we, the attacker, the modern, the more technologically advanced attacker, are able to dish out.

A question that I didn't raise last time, didn't get to and I want to address it now. How was it that the process continued in WW II after



those original notions of precision and immediate enemy collapse disappeared? You see it's the same question that I have had to address in my own life, looking at my own colleagues and the process I was part of in Viet Nam. Really it was quite early in '65 that the Defense Department that McNamara realized that the early hopes of winning without having to commit troops, or with a small number of troops, were wrong. The North Vietnamese were not quitting. Surprise. And as I say he then discovered somehow that it was very hard to turn off the bombing. This is worth knowing because it occurs again and again. I suspect, for instance it's something on both counts that the Soviets did not understand when they went into Afghanistan. It seems to be something very hard to understand from somebody else's experience. The assumption is, they didn't know how to do it, they weren't efficient enough, they didn't have the right equipment, they weren't ruthless enough. The assumption occurs again and again. Our opponents are so much weaker, we know how to do it, that we'll get it over with quickly.

Government officials across the board, different kinds, Soviet officials going to Afghanistan, Vietnamese officials going into Cambodia, expecting a quick victory, Chinese going into Viet Nam expecting a quick victory during the Cambodian operation, Iraqis going into Iran disorganized under Khoumani, armed forces supposedly in chaos, many of the officers shot, expected a quick victory. You recognize that all these people are still fighting. They were not more able to learn from American experience in Viet Nam than the Americans had been able to learn from the French. A contempt, as I say, both for your immediate opponents

and for your predecessors in these interventionary roles. We see it as early then as the Second World War and no doubt earlier.

Why do we keep going? Let's try to understand that a little bit more. One factor is that the early stage of building up the doctrine and the readiness for the bomb which as I say took place well before the Second World War was accompanied by extreme over optimism as to what would be achieved at low cost enormous effects would be achieved essentially domination of the world. It would be possible for a country with a modern air force to really run the world with its long range protection of power, its ease of victory, and in less positive, glowing terms, it could save you in any confrontation you had with a powerful enemy. It could win quickly and cheaply.

By the time that those estimates were found to be wrong, sober estimates were possible. By the time the British discovered that they couldn't fly during the day, that they had to fly at night because they were shot out of the air during the day and thus could not aim at industrial targets as they, too, had hoped to do at that stage, by the time, then that they were confronted with the prospect of going after cities, for what that was worth, you had a fairly large organization in being. Aircraft industry depending on these orders basically, but in particular a very dedicated core of military men, a service, the Bomber Command, that had a strong dedication, an institutional dedication to believing that this instrument was they key to victory, and believing that it would be treasonous virtually, surrender, disaster. To allow the resources that they had patiently built up in the way of an operational

air force to be disbursed to other uses such as convoys, anti submarine warfare, tactical support of ground troops, and so forth, dispersed in the way that they had tried to get away from in building up their independent air force.

So in 1942, the juncture that I described last time, there was a very strong impulse to say that city bombing after all, which was all they could do, was worth doing. An economist might say that the marginal costs of using this instrument seemed much lower now, it's sunk costs, you had an investment, you had done the investment and now even if the benefits weren't going to be critical or crucial, it's worth using it at that point. Likewise the U.S. Air Force later on when it discovered this lack of precision and so forth in '43 and '44.

The effect of dogma comes through very clearly, particularly in the first book that brought out U.S. war plans on an unclassified basis. Terry McCoy Smith's book, Air Force Plans for Peace which was I think published in 1970 and was the first real glimpse we had in the nature of postwar planning and one point that he brought out within the Air Force (he's an Air Force historian who flew combat missions in Viet Nam) was that the crucial, central goal that had motivated this particular service and this was true in England also, was to justify an independent role for the Air Force, to get them out from under the Army which abused airplanes by using it just in close air support of troops, just in coastal defense, things like that that weren't really the proper use for it, that didn't unleash it to be decisive. This led to an immense emphasis on the virtues and the value of the heavy bomber as the justification for an



independent Air Force which, once it got out from under the Army, would be able to claim an equal share of the national defense budget with the Navy and the Army—a third of the defense budget instead of the scraps that the Army would give it and thus be able to buy the kinds of bombers and use them the right way.

With that went a whole set of beliefs that tended to justify how powerful and effective the heavy bomber would be. One of those beliefs was that enemy fighters would be no particular problem, nor would enemy flak, the bomber would always get through, in particular if the bomber was big enough and heavy enough and could have enough defensive armament, armor plating and gun turrets that it could shoot down fighters if it went over in big formations, that it could shoot down the fighters and therefore you just didn't have to worry about enemy fighters. Smith asked the question whether they would have continued to think that if they'd ever really been able to test this in a big way beforehand and he concludes rather interestingly (that's a hypothetical question) that that wouldn't have made much difference because the belief that the bomber alone, a weapon that couldn't be used by the Army very well, unlike fighters, that bombers alone were what mattered. Because in fact he said that the Air Force clung to that belief years after the British Air Force after their experience had found that it was simply flat wrong, that fighters had developed technically faster than bombers had, that they had attained a kind of speed and precision and capability that allowed them to destroy bombers during daylight. The Americans essentially went into the war ignoring that experience and determined to do daylight bombing

when they came into the process about three years later and it took them over a year and half to discover, raid after raid, that they weren't getting through.

The price they paid to hold onto that particular belief, that fighters that can be used by the Army don't matter, only bombers, the basis of an independent Air Force matter, was the flight over Schweinfurt ball bearing factories where they lost 60 heavy bombers, another flight a month later over Schweinfurt, another 60 bombers, a flight over Regensburg where they were blasted out of the sky, they went right through this and were not able to perceive what the British had come to perceive a few years earlier with their experience, you have to have fighter escort which means that the cost of the operation is bigger than they had planned earlier and the effectiveness is not nearly so clear. It's not clear that you can get through to do the destruction you are doing.

Another aspect, though, was the reason that they kept going with this approach despite early unsucccess was a considerable belief that there were again what an economist would call disproportionalities in the input/output function, or in the cost function, namely that you did have to build up quite a big force, to a level of scale before you really got any effect. The reason for doing that was that eventually you would get an enormous effect, you would win the war. But people who doubted that unfortunately were going to have some evidence on their side early on it seemed because in fact you couldn't expect very much early on as you began to exercise these talents, as you began to operate the force. You couldn't expect the first results to be very big so you had to lie. At

his point, let's say a phase B in this process, the institution has come to discover that it's going to be a long, hard pull, they are going to have to build up to a large force for a big effect, and to keep it going they lie about what the costs are going to be and they lie about what the effects are going to be and it's very hard to get them off that very much.

Eventually in the case of the strategic bombing I never asked the question, let me do it now: what was the effect? Well the effect in Germany turned out to be close to zero and that meant that its cost in terms of victory was fairly significant, not only in terms of inputs which was very large. They ended up losing 166,000 members of bomber crews over Europe, 166,000, that's three times our combat casualties in Viet Nam, were lost falling from the sky over Germany. And in fact various calculations were made by a man named Tousard for instance that the total expenditure in terms of training expense as a way of factoring in the lives, the bombers themselves, the cost of the bombs, the whole operation cost more to the British and the Americans to carry out than the value that they destroyed on the ground. And even the lives lost were a significant fraction of the lives lost on the ground altogether.

So in the end the operation in no way was a success in Europe and as such it was an enormous expenditure of resources another obstacle to this harnessing of this kind of destructive power is that it comes in economists' terms, in very lumpy parts, it's part of this disproportionality factor, the individual planes are very expensive, the whole operation is expensive, training a crew took two years or more of very high priced training, extremely expensive training involving



gasoline and other war instruments and bases and the whole process was extremely expensive. Another reason why its participants, who had great faith it would eventually pay off, felt that they had to lie to get it through this initial period, to get the down payment made and to get on with it.

Thus after a decision had been made to go after buildup housing (you'll recall that I said in February of 1942, this crucial moment when they decided that since cities were all you could hit they would not give up on bombing, they would go after cities) after that had been made, C. P. Snow has described and others have confirmed an episode that took place in the British Cabinet in which this approach was strongly opposed. How many people here have read the "Science and Government Lectures" by C. P. Snow? They were quite well known at the time he wrote them which was about 20 years ago. Do you know Snow at all? How many people have read any novels by Snow? He was a novelist who was very interested in processes of bureaucracy and power. He's unique in that, the corridors of power and the motives that drove men to act as they did in high position. He had been a recruiter of scientists for the British government like one of our various science advisors during the war. Here is a couple of words that he had to say about this

It was true that the English and Americans had for years past believed in strategic bombing as no other countries had. Countries which had thought deeply about war like Germany and Russia had no faith in strategic bombing and had not invested much productive capacity or many elite troops in it. The English had years before the war began.

And he's talking about now a man named Lindeman who was Churchill's science advisor, became Lord Farwell during this period.

Early in 1942 Lindeman, who had always believed in this faith, with characteristic intensity, was determined to put it into action.

In his account Snow was criticized rightly for over emphasizing Lindeman's role in this. The basic decision had in fact been made before this dispute that he's talking about. By this time he was Lord Farwell and a member of Parliament and he produced a cabinet paper on the strategic bombing of Germany. It described in quantitative terms the effect on Germany of a British bombing offensive in the next eighteen months, approximately March 1942 to September '43.

The paper laid down a strategic policy. The bombing must be directed essentially against German working class houses. Middle class houses

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base around them and so are bound to waste bombs you'll recall some of this from last lecture, I discussed this but I wasn't just quoting this "factories and military objectives had long since been forgotten except in official bulletins since they were much too difficult to find and hit." The paper claimed that given a total concentration of effort on the production and use of bombing aircraft, it would be possible in all the larger towns of Germany, that is, those with more than 50,000 inhabitants, to destroy 50 percent of all houses and Snow says this.

Let me break off for a minute. It is possible I suppose that sometime in the future people living in a more benevolent age than ours may turn over the official records and notice that men like us, men well educated, men indeed, that may be part of it, but not all of it, men well educated by the standards of the day, men fairly kindly by the standards of the day and often possessed of strong human feelings, made the kind of calculation I have just been describing. Such calculations on a much larger scale are going on at this moment in the most advanced societies I know. What will people of the future think of us? Will they say as Roger Williams said of some of the Massachusetts Indians, that we were wolves with the minds of men? Will they think that we resigned our humanity? They will have the right. [He goes on] At the time I heard some talk of the famous cabinet paper. I have to say this about my own attitude and those of the people I knew best. We had never had the conventional English faith in strategic bombing, partly on military and partly on human ground. [Most people didn't actually prior to '42] But now it came to the point it was not Lindeman's ruthlessness that worried us most, it was his calculation. The paper went to Tisard.

Tisard had been essentially responsible for the development of the radar network and the fighter defense network that foiled Gehring's use of strategic bombings and saved Britain. He was by far the most prestigious scientist applying his skill to military problems at that time. Had enormous prestige, however, had been replaced to a considerable extent by Lindeman when Churchill came in.

He studied the statistics. He came to the conclusion quite impregnably that Lindeman's estimate of the number of houses that could possibly be destroyed was five times too high. The paper went [in other words that they would not kill—no word of killing here—that they would not destroy 50 percent of the houses, but let us say would destroy 10 percent of the houses] The paper went to Blackett.

Blackett later got a Nobel prize as the main developer of what came to be known as operational analysis or operations analysis or the systems analysis that I learned at Rand Corporation.



Independently he studied the statistics. He came the conclusion also quite impregnably, that Lindeman's estimate was six times too high. Everyone agreed [he says, I would have question in my mind about this but at least agreed formally that if the amount of possible destruction was as low as that calculated by Tisard and Blackett the bombing offensive was not worth concentrating on.

There were enormous other uses for the money in retrospect as Blackett points out in a good deal of detail in two books he wrote after the war. The use of the planes, of the steel, the aluminum, the trained crews, the money, of all the resources in general, to close air support, tactical planes, or to landing craft that have made possible a landing on Europe a year earlier, various other uses that could have been made would probably have shortened the war by six months or a year. In other words the use in this direction not only accomplished nothing other than killing large numbers of people in Europe, but was a diversion of resources that kept the war going longer and that's a fairly widely held, not universally, but fairly widely held opinion after the war.

We should have to find a different strategy if the statistics were right.

It fell to Tisard to argue this case, to put forth the view that the bombing strategy would not work.

I do not think that in private politics I have ever seen a minority view so unpopular. Bombing had become a matter of faith. I sometimes used to wonder whether our administrative colleagues who were clever and detached and normally the least likely group of men to be swept away by any faith would have acquiesced in this one as on the whole they did if they had had even an elementary knowledge of statistics.

Let me say I think that's a wrong guess.

In private we made the bitter jokes of a losing side. "There are the Fermi Derock (?) statistics," we said, [talking about quantum theory], the Einstein-Bose statistics and the new Charwell nonquantitative statistics. And we told stories of a man who added up two and two and made four. "He is not to be trusted," the Air Ministry then said, "he has been talking to Tizard and Blackett."

At any rate the minority view was not only defeated, but squashed.

The atmosphere was more hysterical than is usual in English official life. It had the faint but just perceptible smell of a witch hunt. Tizard was actually called a defeatist. Strategic bombing according to the Lindemann policy was put into action with every effort the country could make. The ultimate result is well known. Tizard had calculated that Lindemann's estimate was five times too high, Blackett put it six times too high. The bombing survey after the war revealed that it [the prediction of what could be done in the next 18 months] had been ten times too high. After the war Tizard only once said "I told you so." He gave one lecture on the theory and practice of aerial bombing "No one thinks now that it would have been possible to defeat Germany by bombing alone. The actual effort in manpower and resources that was expended on bombing Germany was greater than the value in manpower of the damage caused."

I think Snow, looking back at that after 20 years and after a little more experience that I've been through, on top of his, was mistaken in some of his guesses of how this came to happen. It wasn't a single man coming in with the confidence of Churchill and swinging everybody to an untenable view. That's pretty much how he describes it actually in the book. The fact is Lindemann probably had very little influence on the bombing policy as far as is known. The reasons (some of which I described last time) for making the policy before Lindemann basically were not really based on the assumption that this was going to win the war very quickly. At that point they weren't all that hopeful.

One particular thing I mentioned was the desire to do something that would show the Americans that the British were not about to leave the war, that they were worthy allies, worthy of major financial and material support as allies and were committed and would not make a separate peace at any point. Bombing, doing something that was likely to cause retaliation and doing something offensive did present them as this and thus the number of houses really didn't matter. In fact looking into this account a little more after the Snow book I find that advocates of Lindeman said, "Look, he readily conceded a lot of this on statistics." One of the memos (I just read a biography of Lindeman) one of his memos that comes out says to Blackett, "After all, the numbers don't matter all that much. All I was really arguing was that a great deal of damage would be done." And of course, in the end, a great deal of damage was done they did "dehouse" as many people as he said. The only difference was that it took a vastly greater effort. That was not a real surprise to Bomber Command by that time. The head of Bomber Command who came in, Harris, understood quite well that it was going to take a very large effort to do the job that he thought would need doing to win the war.

It is in that context then in the 60s and 70s and now that bad predictions have a way of getting adopted and prove impervious to knowledge of statistics by other people. They believed what needed to be believed to get these forces built up, to keep the RAF from being dispersed, to feel that they did have a chance of winning the war and bombing was all they could do. Better statistics would not have changed that at that point.



Was all this dehousing a euphemism for killing? The word killing is not used although it seems hard to believe that the word killing doesn't appear in any of the discussions of any of this stuff although it seems hard to believe that they would be unaware that in the process of hitting workers' housing at night the families might get in the way conceivably of the bombs. But there was another memo actually from Lindeman that suggested to me that he really had managed to believe that he wasn't after people after all he was after housing. He wrote a memo to Churchill saying "the reason for going after housing is that our experience in Hull has shown [the city of Hull] that strain appears when people lose their houses." In fact their morale seems to be more affected by losing their house "than by losing a relative" other person. So we're being more efficient, we're not aiming at the people and it seemed quite important to these people to believe to themselves to a considerable extent that even though they were not hitting factories, they were not hitting military either, they were hitting houses.

Certain people came forward who were able to see more clearly and to accept more clearly what had to be done. I described LeMay last time who really operated with precision bombing for the first several months of his tour against Japan and found that the Musashita steel factory that they were trying to hit just wasn't being hit and the bridges they were aiming at were not going down. Something we discovered again in Korea and discovered in Viet Nam. It was very hard to hit these things. And so he turned to what could be hit on the basis of what had happened with the results I've described.

As I talk about these things, and I've talked about this subject really only a couple of times before. I'm happy to have a course long enough actually, usually I talk for one night to a given audience and I don't feel I can go into this history at all which pains me because I really believe it is very important. The one or two times where I've given a series of connected lectures and I've brought it up have evoked various people coming out of the audience and telling me things that can sometimes be amazingly apt.

Last spring in fact, I was giving a seminar at the Harvard Law School the day after I'd given a talk at Harvard on LeMay, what I've been describing, in the terms that I described to you last time. It was the first time I'd given that talk. And by sheer coincidence the next day a member of this Harvard Law School seminar, Roger Fisher, you may know, Professor at Harvard, international law, whom I knew in the Pentagon, brought up the name LeMay in the course of a quite different talk I was giving. He hadn't known that I talked about LeMay, and it doesn't matter to you, but it was an amazing coincidence to me that he should bring this up. He said, "I was LeMay's weather officer against Japan and I had the following experience." And I said, "Wait, what's that?" He said, "I was the weather officer of 20th Bomber Command." "You were LeMay's weather officer? For example..." And he started to say, "Yes I was going to tell about the raid against Tokyo which had been the subject of my lecture as it was last time." Astounding. I've known Roger for 20 years, slightly, over time, and had never heard this before. So he said, "Well, the point is," he said, again without knowing what my drift on

this thing was, he said, "the story I wanted to tell you was my experience with LeMay on the briefing before Tokyo and I was giving him my usual weather briefing before the operation and he broke in to ask me, 'What do you predict the ground wind will be at Tokyo?' I started to say that we didn't measure ground wind, that our measurements were typically high altitude winds where they usually operate was 30,000 feet and that was about all they could measure. Now it was understood LeMay was interested in lower altitude. As I said they went down to 5,000 feet they had some data on that too but he started to say that they really had no data on what the wind would be on the ground. Why should that matter? The reason they cared about wind was that it threw bombers off course and it took extra fuel and you had to allow for it in various ways in timing. And LeMay interrupted him to say, "How fast would the wind have to be to keep the fire moving fast enough that noone could escape?" And Roger said, "I almost blanked out at that point. I had been doing this for a long time and I'd always believed and assumed that the people we killed were inadvertent and you know, a cost, to be minimized but necessary consequences of our going after factories. For the first time I was hearing from my commander it was his desire to kill as many people as possible." Well, that was LeMay's desire. A former colleague of mine named Sam Cohen of Rand, the father of the neutron bomb and a believer in small precise bombs, tactical bombs which often brought him athwart LeMay told me about two conversations he had with LeMay. LeMay always wanted bigger bombers and he wanted big bombs. On one occasion he was asked in Cohen's presence, "What is SAC's requirement for a bomb, that is military



specification for a bomb to be used against the Soviet Union?" And he said, "One bomb for Russia, that is my requirement." Bombs can't be too big in other words and that was the bombs he asked for, the bombs he got to a large extent. He was very unhappy for example that it was the Russians who tested 100 megaton bomb, we never went that high but he did use 20 megaton bomb. The other occasion was that somebody had been talking about the need for precision and the need to minimize civilian casualties and he took Sam aside at the end of the briefing (I have a picture as he told us of going behind a curtain or something) took him aside and he said, "Sam, war is killing people. When you kill enough people the other guy quits."

My message in talking about LeMay is not that we are in the fix we are in because a person named LeMay, with the characteristics of LeMay got hold of the Strategic Air Command. LeMay does have an unusual psychology in many ways which is interesting. In fact the reason I was talking at Harvard was in part the psychology of the arms race and he's an interesting psychological type, not unique, not typical of the people who run our policy. LeMay wanted to be used. He was a loyal, patriotic, obedient, disciplined, efficient officer and he was used by more than one president. It was Kennedy who found a use for him as Chief of Staff of the Air Force and Johnson who kept him in after he had built up SAC under Eisenhower. And a key belief of the strategic bombing advocates, but not only the strategic bombing advocates, a belief that recommended itself to a lot of people in our government was that if you kill enough people, they have to quit. It was not perhaps the best way to fight a war, it

was not Clausewitz's notion of what a war was about, it is not Lydell Hart's notion of what strategy is, but if you haven't got a better way, it can do the job if you can afford to kill enough people. And as you will have seen, I think, from the accounts of the bombing plans in the fifties they reflected right out of the WW II experience which LeMay had concluded from Japan. The reason it didn't work in Germany he concluded was you hadn't achieved the mass, you hadn't suppressed the defenses, you hadn't killed enough people. In Japan he concluded, with a good deal of evidence, we killed enough people. That was regarded and we won the war with it. Finally they had achieved with several hundred planes, claims of a thousand planes against inflammable targets and so forth, we had achieved the level of destruction that was necessary. It validated a faith that these people had which was very widely shared, it didn't start with strategic bombing, that everyone has a breaking point and if you pound somebody hard enough surely they've got to give in.

The eventual development of the Strategic Air Force in the United States left America especially after the experience of the operation against Japan, left American presidents with the notion that now they had an instrument that could hit anybody hard enough. It wasn't an instrument as I say for a number of reasons that was easy to use. One reason being that using it really did involve breaking through this emotional and moral bias as they saw it, constraint that had been built up to some degree over thousands of years, Christian warfare and theory, chivalric warfare which was the warfare of Christian soldiers, that's how it was conceived by the feudal knights and then later by feudal Christian

kings basically. A notion of warfare as I said that did make this big distinction about combats and massacres and to use nuclear weapons, to use atomic bombs you had to do something that you could no longer really pretend effectively that you were aiming at a factory. With a single bomb wiping out a large part of the city you really weren't able to pretend any more that you were aiming only at military targets and civilian casualties were being minimized. And as I say it was only our leadership that accepted that as a new way of fighting wars as acceptable.

The atomic bomb would almost surely have been regarded as extremely you know, beyond the pale if it wasn't for the circumstances under which it came in. It was introduced... Well imagine, for instance that it had been used by Hitler. Hitler had developed a couple of bombs, as we had, that's all we had and had used them let's say in April of 1945. Would it have changed the course of the war? No. It would not. It would have wiped out the large part of a couple of cities if it got delivered and Hitler would have been defeated on the ground, as he was. So the bomb would have come into the country as the very exemplification of Hitlerian values, just as Hitler was seen before we got into the war in the quotes that I gave you as the man, the leadership, the country, capable of attacking civilians, raping nuns in the picture there, strafing civilians and refugees and so forth, this would have been the proof above all that that's what Hitler was. It would have defined Nazism. Would it not have been the number one war crime tried at Nuremberg? Would it not then have come into the world stigmatized by its use by Nazi Germany in a losing cause. It had been used, it would not have been effective, it would not have won the war, etc.



Consider how it did come into the world, used by us, liberal democracy, the liberal democracy in our eyes, possible addiction of the British and they too were a major part of the atomic bomb program. It won the war. We'll talk about that later, we've read about it but that was the impression, it won the war, it was a decisive weapon, it saved a million U.S. lives, supposedly, and it saved perhaps a million Japanese lives so it was humane even for them, killed x number of people but it saved more Japanese by ending the war. It was not tried at Nuremburg any more than strategic bombing was. In any case any doubts that there were about the bomb which were in fact quite sharp, more than most people my age remember. But if you look back its describing a surprising amount of unease about the nuclear weapon. Especially, by the way, among Catholics, who recognize that as a clear violation of their theory. Despite that that unease was almost immediately overshadowed by the end of the war. VJ Day, troops were coming home, it was a tremendous introduction of that weapon and I think if we die from it it'll partly be for that reason, that so little criticism, so little controversy really arose at that time over the weapon.

Two last points just to illustrate that. One, what I put on the board here is a sample of systems analysis from the systems analysis shop in the Pentagon, Alan Antovinn of Stanford and MIT a colleague of mine, in fact the guy who recruited me if anybody to the Rand Corporation. He was head of systems analysis. He reports it in his book How Much Is Enough? which is a book based on memos that he wrote for McNamara which McNamara presented to the president. Classified memos on the whole which were the

basis of recommendations of what the president ought to buy. There's a lot in the book, very much worth reading. It so happens that Allen was and is a very devout and learned Catholic, great lay studies that he's done in it, very interested in the just war theory in fact and in fact wrote a speech that's been widely quoted on how it applies to our war plans at that time which I helped work on in fact at that time.

I've presented this twice before to make a point and I must say the point wasn't made at all and I'll see if it gets through here or not. The analysis here is intended to show that if you (actually he was arguing for Merved warheads and against large warheads on the whole, but he wanted to show that you could measure the result, the effectiveness of various operations by measures that looked appropriate, looked reasonable but in fact on analysis did not get you where you wanted to go. Specifically he said "A single ten megaton warhead (that's ten million tons of TNT equivalent) is the explosive power of ten fifty kiloton warheads that might fit on a single land based missile, a Merve missile. You could put ten 50,000 ton equivalents on one missile, our Poseidon submarine missile for example, has ten warheads that are about that, about 40 kiloton, in fact he is probably referring to a Poseidon. He didn't say that but a Poseidon had about ten 35 or 40 kiloton warheads. That adds up then to just 500 kilotons, 500,000 tons of TNT versus you could put one warhead on the same missile that would have twenty times that ten megatons, perhaps for the same money, they might cost the same. So that would seem to be a lot better over here, a lot more destructive power. You notice how much Reagan in particular and Paul Nixa talked

before the election in particular about the megatonnage gap, the enormously greater megatonnage that the Soviets could put on.

Well this thing written much earlier than the Reagan Administration was addressed to just that problem. Megatonnage doesn't really matter. You have to ask what the missiles are meant to do. What you are trying to accomplish. So imagine different kinds of target systems and he goes through showing that if you target these things, this is missile for missile now, assuming they cost about the same. Say you target them against hard missile silos. In this case you'll get 1.2 on the average statistically, 1.7 with one megaton warhead you'll only get one. Say you hit an airfield, you'll get ten airfields, ten warheads, ten airfields, 50 kiloton is enough for an airfield. Why do you get only one with one megaton. Because it destroys the airfield and it's only one. You're wasting most of that explosive power. Likewise here you could say you are wasting a certain amount of explosive power. Where does this come out better? Well, you can see that it gets a city of 500,000 whereas that on the average would get only part of a city of 500,000, 70 percent of it, right? Say you go to a city of 2 million, this will get .6 of that. Notice by the way what it takes to hit a large city. This is 10 million tons, that's five WW IIs, but it doesn't get a whole city. A 20 megaton warhead will do that, will get any city.

We used to have hundreds of those, the Russians still do have quite a few 20 megaton warheads. This does better if you are after cities of 2 million or cities of 500,000 but cities of 100,000 you're back, for all of these things this one does a lot better. So how do you balance the



two and Allen then says in the book, "Well, the fact is that there are very few cities like this in Russia, there's really only a couple.

Q:

100 megaton warhead? It doesn't just hit a city. Let me suggest to you why the Soviets tested, actually they tested a 58 megaton warhead in the year that Allen was working on this stuff actually, in 1961 they tested a 58 megaton warhead, the largest ever tested but that was said to be and was understood to be the first two stages of a 100 megaton weapon, that if they'd put a third stage on it it would have been a 100 megaton weapon. Why might they have done that? Actually in retrospect it isn't too hard to know. On their large missiles, then, which were capable of carrying that, they had...I'm sorry, a large missile could carry that. They had four missiles at that year. I have to repeat that has never been revealed to the public. To that day I would say the point I am about to make has never been quite understood by the public as to just how urgent it might have been to the Russians to put a really large warhead on that missile. They had four that year, going on a few more, they were going to get some more eventually, they were so enormously outnumbered that for deterrent purposes it made very good sense for them to say, "If you leave one or two of these left you aren't going to lose just one city." Which was the case. We didn't have a need for that and never have had. We've always gone for the smaller, more precise, larger numbers, because we've been way ahead. It's because they had a smaller number of warheads.

Another point was they were way behind us in precision. They could miss considerably—by 5 or 10 miles even a large city at that time. And that lack of precision is what leads to larger warheads even today. For example, the Pershing, right now, is meant to go according to its design and in tests within 30 yards of the target at which it is aimed on the average. That's 100 feet, you know, from here to there which means that a fair number of the missiles would drop in a silo, would be a hole-in-one actually. That means you don't need nuclear weapon, you don't even need in a sense explosive. You could put a monkey wrench, right, on the head of the thing. You remember what destroyed our, the single act of disarmament that's taken place in the postwar world, the monkey wrench that exploded a Titan missile in Arkansas by getting dropped in a silo. You remember this?

The monkey wrench that led to the explosion of that missile...oh, I'm sorry, let me not get too far away here. The Pershing then really could afford a very small warhead and hit a hard target. It really doesn't in fact, could have conventional, that is high explosive warhead eventually, if it worked. It's quite noticeable over the last couple of years, I mean people who follow this stuff very closely like Chris Payne have noticed that having early predicted that they would put on a one kiloton warhead on this thing, a mere 1,000 tons (firecracker) of TNT that in fact they seem to be programming 10 kilotons which is Hiroshima size, 12 kilotons, which will not be quite as small in its destructive effect. The implication is that they have learned enough not to count on achieving that operational accuracy that they are claiming by the

Pershing because it will give you a hole-in-one but they are putting a ten kiloton warhead on it which suggests that they don't actually expect to get a hole-in-one and that's true across the board on our missiles. The counterparts to this now the MX will have ten 500 kiloton warheads, each warhead, thanks to the ingenuity of Livermore Labs, will have the explosive power of this whole thing. And you might say, why exactly if it's that accurate and you're trying to do counterforce and so forth and the answer is that as in 1942 they have learned not to count on that warhead actually getting as close as they tell Congress it will get when they go for the appropriations, which is why we need it and what it will do for us. But it means in other words the hammer policy is still there and the lying is still there also.

Last point on this now, though. Allen then pointed out and said "OK, the one megaton will work better on this and then we'll work on this. But there are very few of these targets, there are very few of these targets 500,000, and moreover we have large warheads for those so marginally, do we need more large warheads for those? No we would do better to invest in the ten kiloton warheads, Merv, which will cover a lot more targets of the kind we really want. OK, that's the analysis. And in fact it did encourage McNamara to go for Merv warheads. The question that I asked when I first presented this to a Berkeley class was in the spirit of those pictures you've seen, you know, what's wrong with this picture. Like there was a great poster during the war of Nixon holding up a sign of some sort that had a misspelling in it and it said, what's wrong with this picture and if you looked at the upsidedown



writing at the end it said, "The man in the picture holding the slogan is President of the United States."

OK, what's wrong with the analysis? What's wrong with the chart? I'll ask you a question. Come on, let's see eyes lighting up. No, good guess, but the point is made in the text that the costs are regarded as equal here, that's part of the analysis.

A:

No, good guess. I take back what I just said, he did mention Poseidon and his point was the reason by the way you are dealing with such small warheads is that they had to fit in a Poseidon submarine so he said so he said this is much more invulnerable than the 10 megaton warhead. You can hit more targets and it can't be hit. I don't know if you followed that but you get the answer? It's less vulnerable so from that point of view it's even better. What's wrong with the picture here?

A:

Well, the accuracy was assumed to be approximately equal on this so your chances are about as good. These are good guesses but they are not what I'm after.

A:

That's a very interesting point. That does have a good deal of relevance but let me put that aside.

A:

Getting very good technical guesses here, namely that these things will wipe each other out but not if you send them at different targets that are well separated. Fratricide is when one warhead destroys a friendly warhead, a brother warhead by exploding about the same time the other warhead is coming in. And the way they avoid that with these Mervs is by sending two different, not its,...you just avoid it by aiming at widely different targets. This is not sort of the area that I'm looking for. Finally, I'll just repeat the question. Do you see anything wrong with this calculation?

A:

Well, that's like it.

A:

Yeah, let me give an answer. Which actually isn't funny. I don't want to mislead you in my mood here. It's a chart done by American officials of how most economically to destroy cities of 2 million inhabitants or 500,000 inhabitants as if they were airfields. In fact it's not even

merely retaliation because the clear context of this is the response to attack in NATO Europe, an escalation of war in which we might have made first use and in which then it is meaningful to have weapons that can destroy hard missile silos. There is no need to destroy a hard missile silo if it doesn't have a weapon in it. There really is no need to destroy it after it has launched its weapon. A weapon that is designed to get hard missile silos and is optimized for that purpose against this is a weapon meant to be used first. And if part of its advantages are that at least in the eyes of its buyers or its sellers in the Pentagon, that it can not only hit hard missile silos but it can hit other things, like cities of 2 million or 500,000 you are reflecting a fact that not many readers would realize that all of our war plans from 1945 on have contemplated targeting all major Russian cities if we struck first strategically as well as second.

Leon Blum wrote in a diary he was a French politician before the Second World War this, "Quoting Hitler who had remarked privately, we may be destroyed, but if we are, we shall drag a world with us, a world in flames. Joseph Goebbels had also warned grimly that in case of defeat the Nazis would know how to slam the door behind them and not be forgotten for centuries. I'm saying that the Allies, the liberal democracies, picked up in a time of desperation, and for a variety of motives, service motives, political motives, diplomatic motives, in fighting an evil enemy, picked up the methods of that enemy and made them into a private ethic that was indistinguishable really from Hitler's ethic. Blum wrote, toward the end of the war, "I tremble at the thought



that you, the Nazis, are already conquerors in this sense. You have breathed such terror all about that to master you, to prevent the return of your fury, we shall see no other way of fashioning the world save in your image, your laws, the law of force."

BREAK TIME

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BREAK TIME

Let's have discussion

Q:

A new think tank at Cal Tech, no I don't know. They are happening.

No. Yeah?

Almost four times.

Very good question. What were we dropping all those bombs on since we didn't have Schweinfurts and Regensburgs and so forth, nor on the whole, cities, because first of all there aren't many cities in North Viet Nam and second, these cities, Hanoi and Haiphong in particular, the two major cities, were deliberately (Haiphong is more or less the port on the same parallel as Hanoi) these are the two major cities of North Viet Nam and they were deliberately not hit heavily until beginning in 1972 and then at last fairly heavily at the end of '72 in the Christmas bombing they

targeted both Haiphong and the suburbs of Hanoi because they were the only big and this is the word used, hostage targets, and if you hit them right away you didn't have anything left to threaten in the way of coercion. The next week I'm going to get on to theories of coercion or of bargaining with force. But at any rate that was an application of that and the notion that you shouldn't hit Hanoi right away, a notion exemplified in some theories of strategic nuclear bombing. Avoid cities so as to preserve them as targets for coercive purposes. So they deliberately postponed that. Given then that they weren't for most of that time bombing Hanoi and Haiphong what was left? Well, the top civilians would tell you that it was the most carefully, politically controlled, surgical, let's say, operation that had ever been conducted in bombing. And this was probably true. The targeting was supposedly on military targets but including industrial targets, steel, oil, such as existed in Viet Nam which weren't very many and then bridges, headquarters of divisions, training areas, military bases, airfields, air defense, the SAMS that Soviets gave, I put on some of these words here. How many do not know what a SAM is, be honest, I'm interested. OK SAM is surface to air missile. Some of the words that I've been using that are not familiar, SAC, Merv, multiple warhead...some of the names that I gave, P.M.S. Blackett, Snow, Blackett has written several books, I can give you the names of the books, Snow's book, Science and Government, Lilienthal's diaries, this is a book I'll refer to later, Michael Sherry, Preparing for the Next War, Perry McCormick Smith, The Air Force Plans for Peace, Antovin, How Much Is Enough, this is the first book utilizing



declassified war plans. Smith got a lot of this stuff declassified being an Air Force officer. Sherry's book was really the next book that came out that used this followed by names that I want to bring to your attention which are on your recommended reading on the whole. David Rosenberg article which is your required reading, The Atomic Bomb, he's perhaps the most thorough scholar of these war plans now that exists. He's now at one of the war colleges. Herkin, who is on the recommended list, Greg Herkin, The Winning Weapon is a book that I originally meant to require and was persuaded that it was just too long. I can't encourage you too strongly to

CHANGE TAPE SIDE

of the work on declassified war plans. It's all in the last decade, the last twelve years or so fourteen years, and represents a knowledge of war plans that doesn't exist otherwise. If there are other things you'd like me to put up on the board let me do so. Back on the question.

On Viet Nam they were hitting then SAM sites defenses, and various bases and they were doing all this. There are a number of things to know about Viet Nam bombing. The first is that the enormous majority of the tonnage did not go into North Viet Nam. North Viet Nam absorbed about a quarter of the tonnage and possibly less than that, maybe more like 20 percent. About half the tonnage went into our allies South Viet Nam. Again it didn't go into the cities because we were holding the cities, or the province towns on the whole except during Tet when the Viet Cong made

the mistake of sending a lot of their cadre of shock troops into the cities on the belief that once they got quickly into those cities and engaged they would be safe.

They were mistaken. We bombed the hell out of the cities and killed a lot of Viet Cong in the course of that, did them great damage and killed a lot of our close allies. I remember the District 8, a model area run by Catholic civilian cadres who were released from service to do this, a reclamation place visited (I was the tour guide when Hubert Humphrey came in 1966 to inspect pacification, he brought all the people to look at this District 8 project in Saigon, a very terrible slum area that the Catholic Church had essentially built up as a reclamation for refugees, and I took all the reporters around and so forth). After Tet an American couldn't go into District 8. They were so mad that the Americans had blown District 8 to pieces because a few Viet Cong had fired from that area that politically that area was lost essentially but a lot of Viet Cong were killed in the course of this.

Likewise in the rest of South Viet Nam. We destroyed villages routinely when Viet Cong fired at them. This turned out to be a cynical Viet Cong tactic by all appearances in fact that the Viet Cong could gain recruits by entering a village briefly, firing at American planes from it, bringing heavy artillery and air power down on that village, essentially destroying it, driving a fair number of the people to refugee camps and a certain number of people into the jungles, people who had lost relatives in that and preferred now to fight the Americans and the Saigon government, a source of recruiting in other words for the Viet Cong, fairly consistently, a kind of judo.

Moreover about another 25 to 30 percent of the bombing went into Laos and Cambodia. In Cambodia, again without hitting Phnom Penh which was the capital which our people were holding we dropped 490,000 tons of bombs on Cambodia in the course of the war. Most of that secretly except for a brief period when we admitted we were doing the bombing when our troops were in. So we carried on a secret bombing on the scale of our entire tonnage including the atom bombs in Asia. Secret not from the Cambodians, not from the Russians, not from the Chinese, who was hitting them, but secret from the Americans simply because the American public was told it wasn't happening by their president and they believed that. He defined reality for them. It was a power, then that an American president had acquired by 1970, '69 when this started, to conduct again as if Roosevelt had said throughout the war that we were not bombing Asia, Indo China, Philippines, Burma, Japan, areas of China, that was all Japanese propaganda and the American people had believed him. It's the same tonnage. He acquired the ability to do that secretly and be believed. In other words he had an apparatus that could drop it and would keep the secret from the public although it involved thousands of American officers who were aware that bombing was happening and Congress was being lied to about it.

Obviously no steel mills in Cambodia, no military bases to speak of, we don't know actually how many people were killed during that period. The Lan Nul government was not interested in collecting those statistics. The bodies have all been blamed on the Khmer Rouge who came in and carried on a genocidal repression afterwards but it should not



have been regarded Shaw Crosse's point in his book Sideshow about Cambodia that we bear a good deal of responsibility for the Khmer Rouge is tossed off as niggling, or stretching for culpability by Kissinger and by others but represents a very, there are some detailed reasons for seeing us as having a role in that but the general picture is just this. In the course of three years, dropping over 100,000 tons of bombs on Cambodia alone, no, I'm sorry, about 400,000 tons on Cambodia, some on Laos, we converted a country of 6 million peasants living in tight knit peasant communities into a country of 3 million refugees. One out of two people had been picked up from their area where their families had lived for generations or centuries and sent long distances, scrambled up essentially, breaking up families, we simply suffled a society, we demolished a society. That was in effect, you may have noticed in the Rosenberg piece the concept never yet tested with nuclear weapons of "killing a nation."

What this approach did in South Viet Nam and in Cambodia and in Laos, much more than in North Viet Nam which was a much more disciplined society, centrally controlled, and which got much more precise bombing, what we did in these other countries and in South Viet Nam too, about half the people were converted into refugees, in Laos the Plain of Jars was demolished essentially, was that we were targeting not just civilians, we were targeting a society. We were destroying a society. When you hit a city of course you are destroying a society, a reasonably good sized community, a network of people, a culture. When you hit a lot of cities as we did, or villages, as we did in Viet Nam and Cambodia and

Laos, you are targeting a society. You are destroying a society. That has, on the one hand potentially, a peculiar horror, certainly to the people experiencing it it is a new experience, something new and goes beyond as I say the mere fact of killing of people who don't wear uniforms instead of people who wear uniforms.

So ultimately, then, the answer to your question is that whereas in North Viet Nam which you probably had in mind, the targets were rather petty military targets which the military themselves regarded as totally inappropriate for what they were doing. They wanted to hit Hanoi and they weren't allowed to do it. The silly stuff they were hitting was meaning that we were expending more in the way of trained pilots and machinery and everything else in North Viet Nam

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Each of these examples that comes along would we ever have a pride our Air Force, the money that the Air Force to what was done in Viet Nam had we been able to foresee exactly what we would get out of it. Well, given what we did, of course, we lost the war, so we didn't get anything out of it. So one could say that was a waste. But say, short of that, aside from looking at that final end result, was it imaginable that was it easy to imagine that you would get this kind of victory out of it? Well, the Viet Nam war is a whole nother case I'd like to go into later. But the point I was making earlier, in 1965 the Air Force was there to be used. And either you tried to fight the war without it or you hit what there

was to hit with it and we chose that. I won't cut off the question at 9:15, this will just cut in to the later part of the lecture so there will be more questions. Having said that let me pursue this a couple more minutes.

Another principle then related to the question that I raised earlier was, the question was, how did it come about that with early unsucccess they didn't give up? Well let me just name a general rule of this kind of bureaucratic behavior in this circumstance, this convergence. What one saw in the Second World War was that as each level of bombing proved inadequate, the choice made in awareness of that result was to go for bigger, faster, more, more brutal, more powerful. Try it that way.

Why should one come to predict this? Well first because it works that way. It's a good empirical rule. The First World War I didn't mention but another example, the use of troops in the First World War, exactly the same principle. Partly because you don't have any immediate alternative. The alternative is to admit that you've been on a wrong course, that you've wasted a lot of money and lives that have had no effect and could have been used better some other way. Or, keep at it, try another day, and hope that the enemy is near the breaking point. Maybe bigger will do it if we haven't done it, and that's the choice that was made in the First World War, it was made in the Second World War bombing and it was made year after year in Viet Nam so as nothing happened of a useful sort on the way of the bombing the lesson drawn always was not, let's admit we've made a ghastly massive error, let's cut the Air Force out of the war the Air Force never made that decision



somehow, or never allowed it to be made the decision always was, the lesson to be drawn is we haven't done it hard enough yet. Let's hit more targets and of course the lesson that Reagan managed to draw apparently was that the lesson was that we hadn't used nuclear weapons.

But he's not the only one who drew that lesson and I recall a very vivid moment in my own history after I had spent years in the late 50s and early 60s memorizing the characteristics of B-52s and missiles and warheads and the CEPs which I won't define and megatonnage and the kill probabilities and everything so that I could answer practical questions that came up very quickly without having to go to references. I found myself dealing with human size problems on Viet Nam, no more megatonnages, no more millions of deaths and so forth in 1965 and I remember the day that a request came in from Westmoreland to use B-52s in Viet Nam.

Now that won't mean anything to you I would think, but I knew what that would mean to the Air Force as it did then and somebody with this kind of background the B-52 was meant to do only one thing and really it seemed suited to do one thing. It was a very expensive plane meant to be used, trained with a relatively small number of times because it's too expensive and then used for one combat operation—to deliver a large yield nuclear weapon over Russia. That's what the B-52 was for. It was designed for that and people had trained only for that and it was just unthinkable to use it for some other mission from one point of view. And that message meant to me it had the approval of Taylor who was the ambassador at that time. And I remember considering resigning from the

Defense Department at that moment because what that meant to me was they'll do anything. If they'll use the B-52 on targets that you can't even see in the jungle down there, use it from 30,000 feet or higher, dropping high explosive, they'll do anything. They'll use anything for anything, there's no limit to what they are going to do. And that meant to me that they would eventually use nuclear weapons. And I remember that mood very vividly and I spoke to the military assistant, Colonel Rogers to my boss John McNaughton, I said, "Have you seen this cable?" He said, "Don't worry about it," he said, "This Westy wants to use anything that is available, Westmoreland is Taylor's protege, Taylor is now ambassador, Taylor just doesn't want to reject that himself, he's just sending that message in to have us reject it, so forget it, that'll never go anywhere." And so I forgot about it, I sort of cooled off and it took a week or two to discuss and then they decided they had the B-52s and why not use them and it turned out B-52s could drop iron bombs, enormous numbers, hundreds of thousands of tons eventually. But the lesson wasn't wrong that I'd originally drawn. They would do anything and '65 was the time to get out but I didn't learn that at that time.

[About the readings and copying]

Q: Do Russians use nuclear threats?

Yes, in two ways. They made a number of first of all the Russians use the policy essentially of bluff as to what they were building throughout

the 50s. In retrospect both Stalin and then Khrushchev (there was a Bulganin-Malenkov period and then Khrushchev) all raced us at absolute fast speed, as fast as they could, to imitate any given technical development, the A-bomb, the H-bomb, bombers and so forth and in many cases got those weapons ahead of when our top civilian officials expected. The only case in which they actually tested something ahead of us was the ICBM and we proceeded to deploy ahead of them actually, but they did test that. But they did in any case, usually with about a 3 or 4 year lag. In retrospect we know then they did not proceed to go in production on the whole with the exception of MRBMs and IRBMs, intermediate range missiles and medium range ballistic missiles which were targeted on Europe which they built in larger numbers than we expected. But in all these other things they built really only a relative handful of the weapons. That was not the impression they gave. They did their best as far as we can tell, to tell us and to fool us into thinking they had much more than they did although their pretense did not fool the high intelligence circles, or at least some high intelligence circles, but they tried.

During that period Khrushchev several times, in fact, yes, from about '56 on but in particular, well the first example, no actually it was the Suez crisis when I was in the Marines in the 6th Fleet when Khrushchev pointed out that he was able to hit, he said, anybody in the world and he specifically mentioned England, Paris and so forth which he perhaps could have done with intermediate range missiles at that time. He had no ICBMs at that time. He later made several similar threats, for example in



connection with Cuba in 1960 and again in 1961, his ability to protect Cuba from Russian homeland with missiles. That was a time when he had four as I say that could have carried out that threat.

In short, he did a good deal of bluffing and they have to be regarded as bluffs because he just didn't have what it took at all or else he did have some capability but he was so enormously outnumbered it's inconceivable that he meant, privately, that he meant that seriously at all. More recently, since really the Cuban missile crisis they got very quiet. I think there are no examples known to me for a number of years, but in 1973 as you'll see in the Bleckman article they may well have actually transferred some nuclear warheads, at least our intelligence believe that they had through the Middle East at a time when the Egyptians were being surrounded by the Israeli army and that constituted a very pretty serious nuclear demonstration.

There may be a few other cases more recently. There's a book by Steven Kaplan of the Brookings Institution, Kaplan and Bleckman did a book called Force Without Violence on U.S. demonstrations, then Kaplan wrote another book on Russian uses of forces which I have but I haven't read yet. Looking quickly through it I didn't see much examples of nuclear demonstrations though they use other kinds of movements of force quite a bit. I think it's quite possible and this is one of the things I am concerned about, that if the arms race goes on it will evolve on the Russian side in such a way that we will begin, the world will begin to see Russian threats of the kind that they have learned from the U.S. in the past and that will be on the whole not threats against the U.S. just

as our threats are not primarily against Russian, but threats of possible escalation to nuclear war in areas outside the Soviet Union against people who don't have nuclear weapons. If, for example, anybody uses a nuclear weapon and breaks that precedent of nonuse, I expect that to happen I am sorry to say, but it could happen let's just say while the Afghanistan War is still going on and the Afghanistan rebels I think will feel the result of that.

Q:

Yes, well, yes and no, but essentially yes. The Soviets have never... Soviet doctrine amounts to this, they have never bought the morale effect or, as far as we know, the idea of winning a war by killing people, per se. They in effect have the notion of hitting military objectives as the U.S. Air Force had before WW II, however, they plan to do this now with nuclear weapons for all that we know. Nuclear weapons aimed at military targets as the Reagan Administration now claims we aim ours will kill people about to the same extent as if you aimed them at cities because a lot of the targets they mean to hit are in cities.

They have a particular concern for hitting transportation, for hitting command and control centers and so forth just as we do, so that means that in practice it can be assumed that they target cities, oh, they also believe in hitting industry, so in practice they will be hitting cities as much as if they were hitting population per se. By the way we no longer admit, we no longer write charts like this that show

cities. I say we, the U.S. Government stopped that in 1972 under Nixon and if the Catholic bishops were told by Mr. Clark for the President, "You can be sure that we no longer target cities per se," population per se. That change was made at the time that Nixon was considering at last ratifying the Genocide Convention, and somebody in the State Department noticed that eyebrows could be raised about explicitly targeting cities as we always had done up until 1972 and at the same time saying that we would never be a party to genocide since that is genocide. It's retaliatory genocide or it's first strike genocide and so they decided that instead of targeting population per se we would only target military targets wherever they might happen to be and as that was pointed out to the Catholic bishops in testimony they got as they were looking at their problem they were informed that we had 60 military targets in the city of Moscow for example. So the citizens of Moscow are not likely to feel the difference in this shift in targeting policy. The Genocide Convention is not going to protect them if there is a nuclear war.

Q

Good question. The question is that there are those who believe that if Hanoi and Haiphong had been made into parking lots quote early in the war that the war would have been over. The question is do I believe that. First, he is correct, there are people who believe that and in fact they were quite high level. The Joint Chiefs did not actually get, it's true, everything they asked for from Johnson. They essentially did get all the



troops they asked for until 1968, in fact '67 and over time they got essentially all the targets they'd asked for but they did place a lot of emphasis on this notion of shock and it's a very important point because (I'll try about 25 to or so to spend the last 20 minutes on a wrapup) but it was an Air Force belief, actually going back to the 20s and 30s that you not only needed enormous mass in your attack, but it had to be done all at once in a form of shock. That was part of their doctrine, hadn't been tested in a sense was never tested, but the lesson they drew nevertheless... since it wasn't tested they never discarded it and since they wanted to believe that the theory would work they chose to believe (in the Air Force) that the failure in WW II had been due to the fact that the bombing had been too gradual, Hitler had had a chance to build up his defenses, the civilians had had a chance to get used to the bombing, to get used to going into shelters and living under the bombing and so forth, and therefore the reason it hadn't worked at all was that it hadn't been done right and granted it couldn't be done right because they didn't have the planes to do it with. They looked forward to another occasion when it must be done right.

So it is true that in '64 when they began to recommend very strongly the bombing of Viet Nam they were strongly saying you must hit all the targets at once. Don't allow, for example, SAMS to get brought in. That was a reasonable point. Don't allow their defenses to practice on our gradualism and so forth. They weren't allowed to do that partly because the civilians never really believed that the bombing would do that. They gave it a try at first to see what would happen. The result was so

nothing in terms of Vietnamese response, willingness to negotiate, that the civilians concluded that the Air Force had the wrong lesson from WW II and the true lesson was this wasn't likely to have a big effect. If it was to have any effect they felt it could only be when you had essentially stalemated the war in the South. As long as the Viet Cong or the NLF had the chance to win the war in the South they weren't going to give up because they'd lost Hanoi and Haiphong. That was the civilian theory.

I will say that on that point I felt then and I feel much more now, the lesson I would draw is they were right about that. Hitting Hanoi and Haiphong I think it is a wrong theory to believe that the people who in the end absorbed 7.5 million tons of bombs or in the North one or two million tons of bombs without making any concessions whatever to believe that if they had lost Hanoi and Haiphong as they expected to do early on that they would then have given up. So I think the notion that we still know how to do it, it hasn't been found wrong, next time hit the cities right away, I believe that is a catastrophic error that reflects this 50 years or more of false doctrine. Not so obviously false 50 years ago, but I'm saying it's been tested enough now.

Incidentally, one little fact. The reason the U.S. Air Force did not adopt the morale targeting in the beginning when they thought they had an alternative of hitting factories was that they had Air Force officers come back from inspecting of Japanese bombing of Canton and Shanghai in China in 1939 and convinced the Air Force that it didn't do it to civilians. And so our Air Force went for several years thinking, we

won't do that, not because it was immoral, though they thought it was but because it wouldn't work and that was basically right unless you did it on the scale at least of Japan which was not a country like,... which was an urbanized country. Something that the people who applied the bombing theory to Viet Nam failed ever really to adapt to was the futility of trying to bomb Viet Nam into the stone age, the Paleolithic period. Viet Nam is in the stone age. Viet Nam lives as a Neolithic, a late stone age society, it's village, community agriculture basically except for a couple of cities.

And again these people with no sense of history in the Jayseas (??) a very striking fact I think were... I never met anybody once I learned it (it took me a long time) who was aware really of the history and the awareness that the Viet Minh under Ho Chih Minh had fought the French and beaten them for nine years from '46 to '54 while the French occupied Hanoi and Haiphong. The hostilities had begun with the French invading with troops, their former colony which had been independent for a year and a half, in November-December '46 and driving the Viet Minh which was then the government of Viet Nam, North Viet Nam, out of the cities, pursuing a scorched earth policy as they went, taking all the files with them in effect. The French then had those cities from then on.

That should have suggestive as to whether Ho Chi Minh was really ready to conduct a war in the countryside having lost Hanoi and Haiphong. He not only was willing, but undoubtedly was prepared to do that. And could have done that. If he drove them out of Viet Nam he could have done it from Cambodia or Laos. So the same questions did arise.



With high explosive by the way, the Air Force was realistic enough at the end of WW II as Perry Smith points out here, they didn't have an enemy in the world. They thought that maybe Germany and Japan would be resurgent but Soviet Union was not the preferred Air Force enemy because it had characteristics in effect like Viet Nam. They couldn't beat it with high explosive, it was just too big. And they had noticed the fact, by the way, that Stalin managed to conduct the war having lost nearly every city in Western Russian, in European Russia, the Germans occupied them or besieged them, or destroyed them, they fought the war without them. So destroying the cities couldn't give you confidence somehow with high explosive that was going to make the Soviets quit. So the Air Force's initial plans were not against Russia. There was another reason. The Soviet Union was not a threat to the U.S. because it had no strategic bombing planes or doctrine even if they got the weapons.

With the atom bomb (this ties in to our last section here) with the atom bomb the Air Force recognized that Russia could be an Air Force target. Their planes were enough ultimately to destroy enough cities simultaneously and get that. So again the hope was now we've got enough explosive power we can do it even to Russia. Finally I conclude that. I think the idea that hitting hard and brutally was what was missing in Viet Nam. Hitting with enough force is simply an example of the blindness of patriotic, intelligent, dedicated men working within an organization or an administration that feels a compulsion to believe that in the face of all evidence. And by the way I think one other quite recent test of that is what's happening in Afghanistan right now. The

notion I think very prominent in the Reagan Administration and not only Reagan, early in the Nixon Administration, that what was missing in the bombing and the operations in Viet Nam was sufficient ruthlessness is being tested in Afghanistan right now. A lot of people thought that would be over very quickly on the assumption that the Russians would be as ruthless as necessary. I think it can be assumed that the Russians are being as ruthless as they know how to be. They are doing everything we did in Viet Nam. They are doing it hard and fast and they ain't winning.

Q:

How test or why would you want a 100 megaton warhead if 100 megatons is enough to trigger a climatic catastrophe? First point, of course, they didn't test a 100 megaton warhead as I say they tested a 58 megaton version. But you could say how would they want to hit a 100 megaton warhead, second point, Krushchev did not know any more than we did that there was such a thing as climatic catastrophe at that time. If a 100 megaton warhead or a 60 megaton warhead would have done it...surprise! You know, one more of those bureaucratic errors. Nobody's perfect and we would have lost it but the fact is that the results I'm talking about now systems analysis do not say that a 100 megaton warhead will set off climatic catastrophe, it won't.

The 100 megaton calculation was done on the basis of Merved warheads and for purposes of analysis and fairly realistically. 100 kiloton

warheads, 1,000 of them (which doesn't mean, by the way, that you need 1,000) they conjectured that possibly 500 of them would have much the same effect, but they happened to do the calculations with 1,000. That adds up to 100 megatons but it's crucial first of all that it's spread out, and second (three things are crucial) second that its targeted on cities, and third that the attack goes approximately simultaneously. The reason for that is that the major effect is not from the radioactivity though that is an effect, but the major effect is the smoke and secondarily dust from the burning cities. Forests would also do and a lot of things will burn forests, a lot of forests are going to burn in fire storms and they have the same effect. But on the whole you don't target forests, you target cities and those are piles of kindling and the smoke and soot from that will blot out the sun if you hit the cities simultaneously.

If you did just a few at a time it would dissipate and you wouldn't get this cloud that persists and blots out the sun and changes the temperature. So it's critical that you hit all these things simultaneously, as I mentioned before and we'll learn more in the course or you'll see from the Rosenberg articles. Sagan may well not know that he's describing U.S. warplans. Their plan is to use large numbers of warheads on large numbers of cities simultaneously and always has been. So inadvertently they had designed what it took to destroy life on earth.

Q:



I'm going to talk more about Viet Nam later in the course and I think if I gave you a fast answer it wouldn't be of a lot of help because I'd have to explain it. I couldn't give you a quick answer that I would feel comfortable with—I mean a short answer. I'll say one and leave it somewhat inscrutable and we'll spell it out later what I have in mind. By the methods that were actually used, the pacification methods, well, I won't even say that. I would say in a modest but significant sense which would have satisfied Johnson, late Johnson and would have satisfied Nixon and would have satisfied Carter as a victory, yes, it probably was winnable. In fact, I'll say Nixon came very close to winning it in these terms. The terms are not the ambitious terms that Kennedy and Johnson had early between say '61 and '66 of driving the North Viet Nam out of Viet Nam, causing them to quit, killing them all, causing them to defect to the GVN totally. I think that was not possible and that was the early terms of victory that were sent. But they did arrive at a much more modest goal that they sometimes thought of as victory, sometimes just thought of as reasonable negotiated end which involved our staying in Saigon indefinitely and the major cities, allowing the Viet Cong to control the countryside but doing so with fairly high reliability indefinitely with very low cost in U.S. money or casualties or prisoners.

This is the goal that Nixon set himself as Cy Hersh brings out as a revelation in great detail in his book The Price of Power which I strongly recommend to you. It's on the recommended reading and in particular the portions that are on the recommended reading especially those of you that are interested in Viet Nam. No review of Hersh has

brought out that he has very convincingly, one of the spectacular results of journalistic reporting, investigation that's ever been done totally I think, convincingly that Nixon had a policy of effectively winning the war in this sense and implemented it and came close to achieving it.

His method essentially was first to threaten heavy bombing then, when that did not work in '69, to carry out heavy bombing and the promise of more. So the point that I've been making up to now is not that bombing cannot achieve any political goal, any political task that you set it. God knows Nixon did foresee that he would end up dropping 4.5 million tons of bombs to come close to victory. And I would not have expected that the American public would let him get away with it. So when I was asked by Henry Kissinger in December 1968 in the Hotel Pierre when we were preparing the first Viet Nam option paper which I wrote for Nixon on Viet Nam he said, "You have not included a win strategy."

And Tom Schelling who is on the reading list here was in the room and he said, "You know, I think even if it is too costly, even if it seems to risky we should at least tell the President here is how you could win." You know to compare it to other alternatives. And I said,

"I don't think there is a way to win." I said, "you could put two million troops in Viet Nam and keep the place very quiet as long as they stayed there and not when they left. Or," I said, "you could use atom bombs and kill everybody in the country. I don't regard that as a win and I don't think there is any other way to win."

These people who could not be coerced by 3.2 million tons of bombs are not going to be coerced by more escalation in my opinion. What I am

saying to you is now I was wrong. Partly I didn't consider what you could do with the threat of nuclear weapons on top of the experience of 4.5 million tons of bombs. He got concessions out of the Vietnamese that were not the win in the big sense but I think could have kept things quiet there for quite a while had the bombing gone on indefinitely. That win strategy was contemplated by Nixon as bombing indefinitely which I wouldn't have been for in any case. But it could have kept the cities in the hands of the U.S. We might or might not still be able to hold Saigon but we could still be bombing Viet Nam for sure had not Nixon been removed and had not his policy been halted by Congress acting under pressure of the public.

And why was a I wrong, what mistakes did I make? I frankly did not consider that Nixon could do 4.5 million tons of bombs starting in 1969. I don't know how many of you remember the mood of that time but I wouldn't have thought the American public would let him do that. I was wrong. They did let him do it. Partly by absolutely brilliant management of public opinion by Henry Kissinger for Richard Nixon. So there's and answer. I must say that at the time I gave the Pentagon Papers

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by my boss at Rand, Harry Rowan, the president of Rand who did not know I was copying the Pentagon Papers at that time. What I thought Nixon's policy was and why I was so critical of it and I said, "Well, what

worries me is that I think," (by this time late in '69, the earlier exchange was the early '69; by late '69 I believed Nixon was going to try this approach and I thought he might succeed for quite a while from what I could see of the public) and I said, "I think he is trying to reduce the costs and reduce the casualties and rely essentially on bombing and keep the war going indefinitely with U.S. bombing and without the casualties and so forth."

And I said, "the American people might accept that." So Harry said to me, just reacting to what I'd said,

"Well, if he could do that," and I said I thought he might be able to do it but this time (this was October '69) "and the American would accept it, what's so wrong with it?"

And I said, "Because it would mean bombing Viet Nam forever and that's not acceptable to me."

So I was at that time, unknown to him, I was doing public things but I was doing some private things, I was spending my nights copying the Pentagon Papers which was my effort to oppose that strategy, not because I thought it couldn't work and as I say, in the end, it did come very close to it but at the price that I've described. Let me wrap up here in the last ten minutes unless there's one last urgent question.

Q:

Yes, the... Good point... The point which I doubt if you could hear was that there was possibly a minirevolution brewing in the country had he

carried out his plan as he planned to do at that time. Since there's so little time left I think I will put off really addressing till a later lecture at some point, addressing the subject, maybe when we get in the preemption and the so forth, instability. I'll deal with the war plans in that later section on preemption and instability, we'll go to the threat aspect now which carries us right into the Viet Nam so it's a pretty good introduction to it, and I'll just say by summary for those of you who have read this stuff, in fact, let's see what I can do in three minutes.

There are those who say that my credibility on promises like that is not good but I'll try here, I don't want to spend all the time. I'll be closing at ten and spend up to five minutes on the three hour lecture that I had in mind when I came in which is the implication of the atom bomb for our war plans. How many have read the Rosenberg piece? And how many have read my BNSP papers, which are known as basic national security policy? Well, most of you haven't anyway so, if you read it, though, which I urge you to do for the quiz next week, that is the Rosenberg, you will see that the basic philosophy that the man in charge of our nuclear war planning, who happened to be Curtis LeMay who was chosen for that, applied to the design of the war plan was simply the philosophy that he had concluded, he didn't start with it, but he came to act on in Japan, kill enough people fast enough.

You may remember the quote last time, "I wanted to hit those next seventeen cities as fast as possible—shock, don't let them go from one city to another and recover, hit 'em all at once as close as you can."



You'll see then that LeMay's plans consisted, year after year, in trying to plan it so that the entire stockpile of American nuclear weapons would be delivered simultaneously on the cities of Russia. And cities were what he believed in.

There were those again who again had learned other lessons from WW II and wanted to hit oil and wanted to hit steel and this and that, but Curtis LeMay was always clear that he couldn't find those targets, he couldn't get to them, population was what you were after he was very clear on that, and he was in charge of the SAC planning. So as you'll see, within weeks of Hiroshima, ten weeks or so, the Joint Chiefs had done a study, now looking at Russia which picked 20 cities in Russia for nuclear attack. Target lists had come to mean cities at that point and that's what they stayed for a long time, for a good decade, really, and they always included cities. So the first targets were cities.

We didn't have 20 atomic bombs at that time, in fact we didn't have operationally 20 bombs for quite a while, several years, but as we got more the target list expanded, 30 cities, 40 cities, 70 cities, that lasted for a while, 133 cities by the end of the decade. 133 cities to be hit, which again was just a little bit more than we could do at the time that plan was actually written, in the hopes of achieving a decisive end. And about that time LeMay had come to believe that if you hit all those cities all at once it would be decisive, he'd gotten where he wanted to get.

Then, as you'll read in the Rosenberg or in Herkin, a report was done like those early reports, those proto-intelligence reports in WW II in

'41, hitting those cities with atom bombs won't do the job. They will not be decisive in a war with the Soviet Union. These are 50 kiloton warheads, that's two and a half times Nagasaki, almost four times Hiroshima, fairly large warheads. You notice that even a 10 megaton warhead doesn't get your larger cities. But even in Hiroshima (there's two aspects to this) even in Hiroshima, a city of about 400,000, as many people lived as died. More than half of the people of Hiroshima lived.

The Russians, and Blackett, who was the operations analyst in Britain, came to this conclusion as early as 1948. Atom bombs don't stop Russians for two reasons, they don't do as much damage as you imagine. The imagining here was the absolute weapon notion that Bernard Brody, later of Rand, published early in the 40s, the first book on the atom bomb, The Absolute Weapon. The fact is that... in fact, having gone this far I will pursue this point till ten. I lied. I'm adjusting. What they found was, the Harmon Report found, that even if you did destroy the cities with your atom bombs if you had enough, you would not stop the Russian army from invading Western Europe. They didn't depend on those cities, any more let us say than the Viet Minh depended on Hanoi for its operations.

In the long run, of course, it would affect them, but within weeks they would have the cities of Western Europe, or a month or two. So having lost their own cities they would have gained a lot more resources which we would then be challenged to destroy or not. (Footnote, our plans called for destroying those cities of Western Europe with atom bombs after they were occupied by the Russians in the early days.) But

that, you know, wasn't clearly going to win the war either. So the astounding, rather startling fact came out in '49 that having built your whole defense on the key thing that you were confronting the Russians with was these atom bombs, was the notion that the Russian army remained a deterrent.

If you ask why the U.S. did not come close to using its monopoly in a preventive war when it had a monopoly, the answer is that it is not because the thought did not occur to anybody up there. As a matter of fact, as you'll read in Herkin, Stewart Symington essentially recommended just that in early 1951. You may recall him as a man who became a major Senatorial critic of the Viet Nam war but who was also for many years a major member of the Congressional military industrial complex, and he essentially recommended an ultimatum to the Soviet Union in early '51. But it was always understood during that period that we didn't have what it took. The Soviets had a deterrent and the deterrent was the Red Army. And that, by the way, is one reason why the Red Army was as big as it was (and is as big as it is) in those days. It was kept as big at great cost. The major reason was to hold down the satellites, but a major other reason, quite conscious in the Russian mind, was to say "If you hit us for any reason you are going to lose Western Europe."

What was the effect, then of that discovery? Let's apply my crude little model. When a major institution which has been built on its share of the budget (which no longer was one third, but now as a decisive weapon they were going for a half if possible of the budget) finds that its mission won't do the job that it was designed to do apparently, what



happens when an administration which has put its chips, however reluctantly, on that service and that weapon, discovers that it won't do the job? Does it then say those critics who have said this is a) immoral (which included the U.S. Navy at that time, very strongly) and b) will not work, shall we conclude they were right and that we should find other deterrents, other ways of fighting confrontations, this one doesn't do it?

It's not what happened in this case. In early '49 when the Harmon Report, and other reports later then, came out with similar results (that Blackett had foreseen as I say in '48 and the Russians had foreseen in the early postwar period) the result was to conclude: we need more bombs and bigger bombs, bombs without limit. It wasn't clear at that time that the H-bomb was possible, but the H-bomb decision was essentially prejudged in early '49 before a Soviet A-bomb had been exploded which was in late August of '49. By the findings that the current stockpile, enormously large by the standards of '45 or '46, you now did have the ability to deliver on Russia the kind of destruction in one blow that had taken years to levy on Germany, the discovery of that wasn't enough, at which point Truman came down for new facilities for building fission atom bombs, bigger and more efficient atom bombs and was moving fast toward the decision to build the H-bomb.

I started this course basically by pointing out the critical moment in my life when I discovered that I lived in a country, and worked in the Defense Department of that country, that had designed and implemented, prepared plans for destroying half a billion people. And I already said that at that time I began the quest in my life to understand how this had

come about. I'm bit by bit sharing that understanding that I'm coming to (although that's not the only focus of this course) but in part to understand how mankind could draw back from this since I did not assume that the U.S. was the only place that had such plans, or the only place that would have such plans. If we could do it other countries could do it. So how had this come about?

Well, in a very brief summary, as you'll see from Rosenberg, plans developed in the 20s and 30s, applied in the 40s for high explosive, which on the whole had proven ineffective in the 40s, were thought to be vindicated by the existence of an A-bomb that now would do the job. You could do it all at once, you could do it right at the beginning, you didn't have to build up, it was enough explosive power to hit everybody right at once. That would do what Douhet had dreamed of doing. It would have to be done on a big scale, not a small scale, but it would be decisive. They simply fitted atom bombs into the same plans they had been writing in the 40s. The casualties did not go up. The casualties they were expecting were 2, 3 million, maybe 10 million, large casualties but in WW II range.

The same casualties that the Russians had in fact recovered from. We'd never experienced them, casualties like that, and we rather quickly imagined that it took that to deter the Soviets. We developed this idea that the Soviets were really quite light-hearted about WW II, just waiting nostalgically for the day when they could all enlist again in WW III and that you would have to promise much greater destruction to keep them from reliving those glorious days of the past. That is not the

impression you get when you talk to Russians actually. But we could imagine that because we had not ever felt bombing—unlike most of our allies.

Then the H-bomb came along. The H-bomb was the absolute weapon. That was the weapon that Teller had been seeking, that was the weapon that Brody thought we had in '46 but we didn't have it. The H-bomb was a thousand times more powerful than the atom bomb. Actually it turns out you could do the nuclear winter with fission bombs if you have enough of them and you have developed them to 100 kiloton size (which it took a while to do) but you got there a lot faster with H-bombs and that's how we did. And again, just to summarize all that stuff, the H-bomb simply was fitted into the same plans as the A-bomb plans which were the same as the HE, the high explosive plans. And the casualties expected went from 10 million to 600 million and not many people knew that. And the people who did know it were organization people or terribly dedicated Air Force people or whatnot who had had 30 years or more of deciding that this was OK to threaten. And they didn't bother telling other people. And that's a capsule of where we got.

I don't want to leave on that last note so I'll add this in line with the questions I was getting earlier about Viet Nam. Is there a way out? I think I referred to (and it will be on the recommended list if it isn't already) a piece by Tom Power (no relation to General Power) in the Atlantic about a month ago, who says in that piece that he really thinks this is going to happen. He sees no hope of avoiding the triggering of this mechanism. And he's just giving a post mortem.



That's not what I think of myself as doing in this course though it's a reasonable point. [Hold off, this really will be two minutes. One sentence here.] An earlier piece that he wrote, "Thinking about the next war," by Thomas Power: he says, "Imagine for a moment that a nuclear war has taken place. Don't concern yourself over much with the details of when or where or between whom—there are plenty of possibilities. You have survived as so many survived Hiroshima and Nagasaki [supposedly]. You have time to reflect whatever may still be waiting in the wings. Ask yourself, did anything in the years after 1945 ever suggest a different outcome?"

I think of one thing which he isn't taking into account and he didn't take it into account at the Atlantic, Power. There is no mention in any of his articles (Thomas Power's articles, which I recommend to you) of the existence since he wrote this (about 4 or 5 years ago) of the existence of the largest anti... the largest political movement that has really ever existed, either in Europe or the United States. We haven't tested what it can do but there really never has been such a movement before. It has not achieved any effect yet on our policies, but it hasn't been here very long.

That movement grew out of a circumstance that I had been putting my hopes on for a long time, the gradual revelation to the public of the nature of our war planning and the values and purposes, the instincts, the willingness to threat, the willingness to risk, of our government which had been withheld from them up till that time. In 1969 when I put out the Pentagon Papers which was just a history of the war, a history of

Viet Nam, like the history I'm giving you now, my wife asked me as I may have mentioned before, "Why bother, nobody else seems willing to do this. Why are you taking this risk?"

I thought I would go to jail for the rest of my life. When we got married I told her, "You have to understand, I'm putting this out and I don't know how long we'll be together. I expect to go to jail forever."

"Why?" You know, "Why is that worthwhile?" And I said,

"Because I think these secrets have been kept secret, our history has been kept secret, from an American public that would not have accepted these policies if they had understood what the policies were and that's why they have been lied to. I believe they have been lied to because the presidents thought (in their best patriotic instinct as to what the country needed) thought they wouldn't get what they thought was right if they told the truth. And I think the presidents were right. I don't know that but I'm ready to test it.

I believe there's a chance the American public will act to change that policy when they come to understand what it is likely to be and where it's going. And I think that turned out to be right in that instance; which gives no guarantees as to what's possible in the future, but it tells me of a challenge that we have and a responsibility. So you hear a lot of bad news in this course—bad news about this country, about other countries, about our leaders; and it's true I think, as far as I can tell.

But the good news is, I think, on the one hand this, to a less extent, I think our leaders are trying to do their best, they are trying

to do the right thing. They are patriotic, they believe that what they are doing is right for everybody, not just for themselves. If it sounds sometimes as though I'm judging them, as if I'm condemning them as monsters or whatever (which was closer to the way that I did see them for a while when I was trying to understand what was going on) that happens to be not the way I see them now. I see them pretty much as people like us in an organizational role that does in fact free them from limits in their eyes of what they have a right to do and what it's reasonable for them to do and makes them very dangerous—and not only them, makes a lot of leaders dangerous.

But the other side, I think, is that the American people have never bought on, not being in that organizational position, to this sense that it is right to risk the world for the reasons that our leaders are willing to do it. They did not in fact, I think, buy on to the notion that it was all right to kill Vietnamese to an unlimited degree and they stopped the bombing. They showed that power. Nixon I believe is right when he says he did not lose the war. The American people ended that war. They took his victory away from him. They prevented him from bombing indefinitely as he was prepared to do.

It's a responsibility I think we should own up to. We—those who took part in it, or sympathized with it—and not shirk from it. The consequence is it is a sign of power. Only the American people could stop those bombers from flying, and they did that. We did that. I think it is up to us to do it again.

(APPLAUSE—JOINED BY TRANSCRIBER)